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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/760,633	01/20/2004	Andy Kung	08919-116001 / 07A-920912	8262
26161	7590	11/16/2005	EXAMINER	
FISH & RICHARDSON PC P.O. BOX 1022 MINNEAPOLIS, MN 55440-1022			FRANK, RODNEY T	
			ART UNIT	PAPER NUMBER
			2856	

DATE MAILED: 11/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/760,633

Applicant(s)

KUNG, ANDY

Examiner

Rodney T. Frank

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 August 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-39 is/are pending in the application.
- 4a) Of the above claim(s) 13-24 and 32-42 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 9-12 and 25-31 is/are rejected.
- 7) ☒ Claim(s) 5-8 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>01/20/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of Group I, claim 1-12 and 25-31 in the reply filed on 18 August 2005 is acknowledged. The traversal is on the ground(s) that the examiner has not shown how the claimed inventions are patentable over each other or independent. This is not found persuasive because the groups, as restricted are patentable over each other and independent. For example, Claim 13 has a light source with an emission spectrum with an emission peak with a full half width at half maximum greater than 1nm and a detector to detect a signal indicative of absorption of modulated light. Claim 1 has an ultraviolet light source to generate ultraviolet light at wavelengths shorter than 400nm, and a microphone to detect an audio signal. These two devices, when the claim limitations, are different and patentable one from another. Locating a microphone to detect an acoustic signal and a detector to detect absorption do not have to be the same thing. This is a distinction between groups I and II, and thus the restriction between the two is deemed as proper. For claim 23, the device has two resonator tubes and two microphones. Compared to a single chamber and single microphone arrangement of claim 1, these two devices are independent and patentably distinct over each other, and thus the restriction is deemed proper. In a similar fashion, the same arrangement of two tubes and two microphones, is not required for claim 13, as there is no microphone in the claim language for claim 13 at all and even if the detector were deemed a microphone, there is nothing indicating multiple detectors, so again the restriction between this group is deemed proper. With this explanation, the

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examiner has given the explanation that the applicant stated was previously absent and reason why the restricted claims are independent and patentable over each other and thus the restriction is maintained.

The requirement is still deemed proper and is therefore made FINAL.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 2, 3, 4, 9-12, 25, 26, and 27-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arnott et al. (U.S. Patent Number 6,662,627; hereinafter referred to as Arnott), and further in view of Small (U.S. Patent Number 6,694,799).

Arnott discloses a photoacoustic sensor that measures carbon black particles emitted in the exhaust gas of a vehicle traveling on a road or being tested on a dynamometer or engine stand. The sensor includes an acoustic waveguide and a pump mounted to an outlet of the waveguide. The pump pulls the gas through the waveguide. A critical orifice is mounted between the pump and the outlet. The critical orifice prevents noise generated by the pump from entering the waveguide. Optical windows are mounted at opposite ends of the waveguide. A modulated source of light is located adjacent one of the windows and irradiates the waveguide. A microphone is attached to the waveguide. The microphone detects an acoustic signal generated by absorption of the light by the particles in the gas. The acoustic signal is proportional to the mass concentration of

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particles in the gas. The microphone generates an electrical signal proportional to the acoustic signal (Please see the abstract). With respect to claim 1, Arnott discloses, and shows in the figures, an acoustic chamber (20) having an inlet (60) to receive a gas and an outlet to remove a gas (with the help of pump 74), a light source (90) to generate UV light at a modulated frequency substantially equal to the resonant frequency of the acoustic chamber, and at least one microphone (110) to detect an audio signal in the acoustic chamber. Arnott does not disclose the UV light source having a wavelength in the range specified.

Small discloses that the invention includes a particle detection system that detects bioparticles in a sample utilizing a sensor device that receives photoacoustic signals from a sample. The invention includes a system for distinguishing biologically active particles from non-biologically active particles in a sample utilizing a transducer to receive a laser induced photoacoustic signal from the sample and a fluorescence detector to receive laser induced fluorescence. The invention includes a method of screening a sample for the presence of one or more particle types by subjecting a sample to laser light and measuring at least one photonic response and at least one acoustic response are measured from the sample to produce a sample composite data set which is compared to a signature data set from a control sample. The invention also includes methods for detecting a change in the particle composition within a test area (Please see the abstract). The motivation to combine the two references is that they are both concerned with photoacoustic measurement and specifically Small provides details of how to induce a sample in order to get a signal in order to make a

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measurement. With this in mind, Small discloses in column 3, lines 45 through 57 that a laser with wavelengths between 250 and 700nm are used. One of ordinary skill in the art would have therefore been able to replace the light source disclosed in Arnott with the laser with the specified wavelength as disclosed in Small to arrive at the present invention as claimed.

With regard to claim 2, though the emission spectrum is not specifically disclosed, this limitation would be obvious to one of ordinary skill in the art as the use of said claimed spectrum is known to be used dependent upon the particular application and therefore the device in either Small or Arnott is capable of having said emission spectrum (One such example is with Raman spectroscopy, as disclosed in Berry et al. (U.S. Patent Number 4,197,009, where berry states that at resonance, the emission spectrum as claimed would be used (see column 5 line 59 through column 6 line 10)).

With regard to claims 3 and 4, Arnott discloses in relation to figure 4 that a computer processes the signal in order to determine gas concentration.

With regard to claims 9 and 10, Small discloses that the light source can be a laser or a non-laser light source in column 3 lines 62 through 65. Since an electric discharge lamp is a no laser light source, providing light from applying voltage to a gas (such as xenon), then this limitation is disclosed.

With regard to claims 11 and 12, Small discloses the wavelength range, which his laser operates, which covers the range in the claim. Further, both references discuss the use of a modulated light source that operates at the resonance frequency of

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the chamber, so any chamber size can be used, as selectable by the user to optimize measurements.

With regard to method claims 25-31, the combination of references teaches the device in the claims, and thus, the operating method for the claimed device as taught by the combination of references would have been obvious to one of ordinary skill in the art at the time the invention was made.

Allowable Subject Matter

4. Claims 5-8 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

5. The following is a statement of reasons for the indication of allowable subject matter: The prior art does not disclose nor render obvious the use of an acoustic chamber with two tubes.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rodney T. Frank whose telephone number is (571) 272-2193. The examiner can normally be reached on M-F 9-5:30 p.m. EST.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron E. Williams can be reached on (571) 272-2208. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

RTF

November 8, 2005



HEZRON WILLIAMS
SUPERVISORY PATENT EXAMINER
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